

CELLULAR

Robert K. Tendler, Chairman

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October 14, 1997

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Mr. William Caton, Acting Secretary
Federal Communications Commission
Room. 222
1919 M Street NW
Washington, D.C. 20554

CC Docket Number 94-102
WRITTEN EX PARTE PRESENTATION

Dear Mr. Caton:

Your presenter, Tendler Cellular, Inc. of Boston, Massachusetts is the developer of the FoneFinder™ system which utilizes an integrated cell phone handset/GPS receiver/speech chip to provide both ANI and ALI verbally to the PSAP. The salient point of the FoneFinder system is that there is no infrastructure required in order to obtain ANI and ALI. There are no changes to cell site switches and there is no necessary additional infrastructure at the PSAP that the PSAPs do not currently already have.

Introduction

It is the purpose of this presentation to inform the Commissioner that there is a tested and cost effective way to implement the requirements of the Report and Order of June 12, 1996, CC Docket Number 94-102, RM-8143 that being the handset solution offered by the FoneFinder system. (See materials and news articles - Appendix A.)

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Discussion

It is recognized that there are two solutions to providing Automatic Location Information (ALI) in accordance with the Report and Order of June 12, 1996; e.g., triangulation systems including TDOA type systems and handset/GPS type systems. It is noted that at \$50k per cell site the infrastructure cost in order to implement triangulation type systems is in excess of \$6 billion, assuming 10 carriers. (See enclosed paper given at the National Communications Forum in Chicago-Appendix B.) Because cost recovery for implementation of triangulation systems is difficult, it is understood that a number of carriers are seeking some avenue not to have to implement the ALI requirement of the Report and Order.

The Tandler Cellular FoneFinder phone provides that opportunity.

Note that the FoneFinder system, presently built into an Audiovox model 405 cellular phone, has been tested by several of the carriers and found to operate quite satisfactorily.

Also, the FoneFinder system has received support from both APCO and NENA.

What the Audiovox 405 FoneFinder phones do is to verbally report latitude and longitude within 125 meters 67% of the time, or more importantly 100% of the time, assuming that the FoneFinder's GPS antenna can "see" the satellites. This is true not only in rural areas, not only suburban areas, but in most urban areas, with a time to first fix for a so-called "hot start" being under 20 seconds (e.g., all GPS data including time of day, almanac and ephemeris being available and stored at the time of power - on of the FoneFinder's GPS receiver).

Moreover, with the removal of selective availability or S/A the accuracy is 10 meters (see reply to NPRM-Appendix C).

Although FoneFinder units do not operate in buildings, EMT groups do not see this as a drawback as landline phones are available in buildings.

Arguments against the requirement for the handset solution center around what to do with the embedded base of phones. As will be seen from the revenue streams realizable through the FoneFinder system, one could theoretically bring in the entire existing cellular phone base and switch out the base to FoneFinder phones, with the revenue streams derivable from the FoneFinder phone fully funding the new equipment.

Revenue Streams from the FoneFinder System

A recent survey conducted by Public Opinion Strategies of Alexandria, Virginia indicates that customers would be willing to pay between \$3 and \$4 a month for emergency location services (see Appendix D). Further, a recent marketing study conducted by The Strategis Group of Washington, DC indicates that individuals will pay between \$7 and \$9 per month for location services (see Appendix E).

As contained in a paper presented to the National Communications Conference (see above), the revenue streams achievable through the FoneFinder phone include cost recovery for the additional hardware in order to add a GPS receiver, antenna, speech synthesizer and CPU to an existing cell phone. As has been documented, the additional cost for adding the FoneFinder system to a cell phone can be amortized over a three year

period at a \$4 per month charge to the customer. This is clearly within the guidelines of the above survey and study.

A second revenue stream achievable through the utilization of the FoneFinder system is a so called "National Concierge Service" which provides not only roadside assistance, but information regarding hotels, restaurants, drug stores, hospitals, ball scores or any service normally provided by a concierge. Revenue streams for the "National Concierge Service" back to the carriers to offset the cost of the FoneFinder phones are on the order of \$2 to \$3 per month.

The third revenue stream associated with the FoneFinder system is a 911 Back-up service which is an optional service activated by the user. In this service, after the primary call has gone to the PSAP, a call is placed to a dispatch agency which inquires as to whether the individual has been helped or not. If not, the dispatch agency telephones the appropriate PSAP on its backline to make sure that the ambulances, police cars, fire engines, etc. are on the way. It is possible to quantify a revenue stream back to the carrier for such 911 Back-up calls on the order of \$20 per call.

What can be seen from the above is that the cost of completely replacing all of the present analog cell phones with FoneFinder phones can be borne not only by the air time associated with the phone call but also by the three revenue streams mentioned above.

Summary

In formulating policy for the implementation of the Report and Order of June 12, 1996 it is noted that the FoneFinder phones presently provide both ANI and ALI as

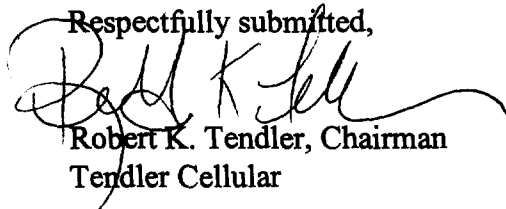
required. What is also demonstrated is that FoneFinder-equipped phones can generate a revenue stream which will more than offset the physical cost of the phones.

If it is envisaged that there will not be a complete replacement of the embedded base with FoneFinder phones, the above revenue streams go a long way to funding other types of approaches for locating wireless callers.

It is therefore suggested that the FCC consider declaring that the ALI requirement of the Report and Order of June 12, 1996 can be met by the GPS/handset approach, and that the requirement for carriers or wireless phone manufacturers to provide ALI as it relates to the embedded base of phones be waived upon deployment of GPS-based handsets. In the view of Tandler Cellular, the GPS/handset solution should be mandated. The minimum requirement would be a combined cellular phone and GPS receiver, with some means of transmitting that information to the PSAP in a non-costly manner (namely with speech synthesis). The FoneFinder system, involving no additional infrastructure, meets this requirement.

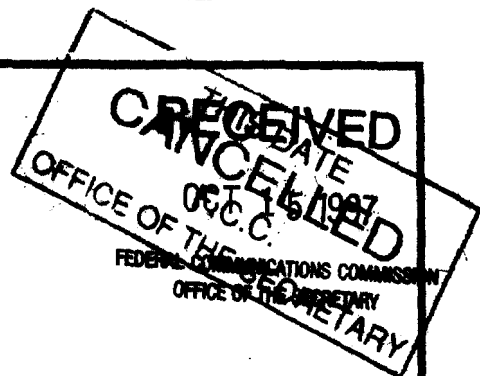
Consideration of the above comments is requested.

Respectfully submitted,



Robert K. Tandler, Chairman
Tandler Cellular

cc: Won Kim
John Cimko
Ben Daniel Grosh



TENDLER
CELLULAR

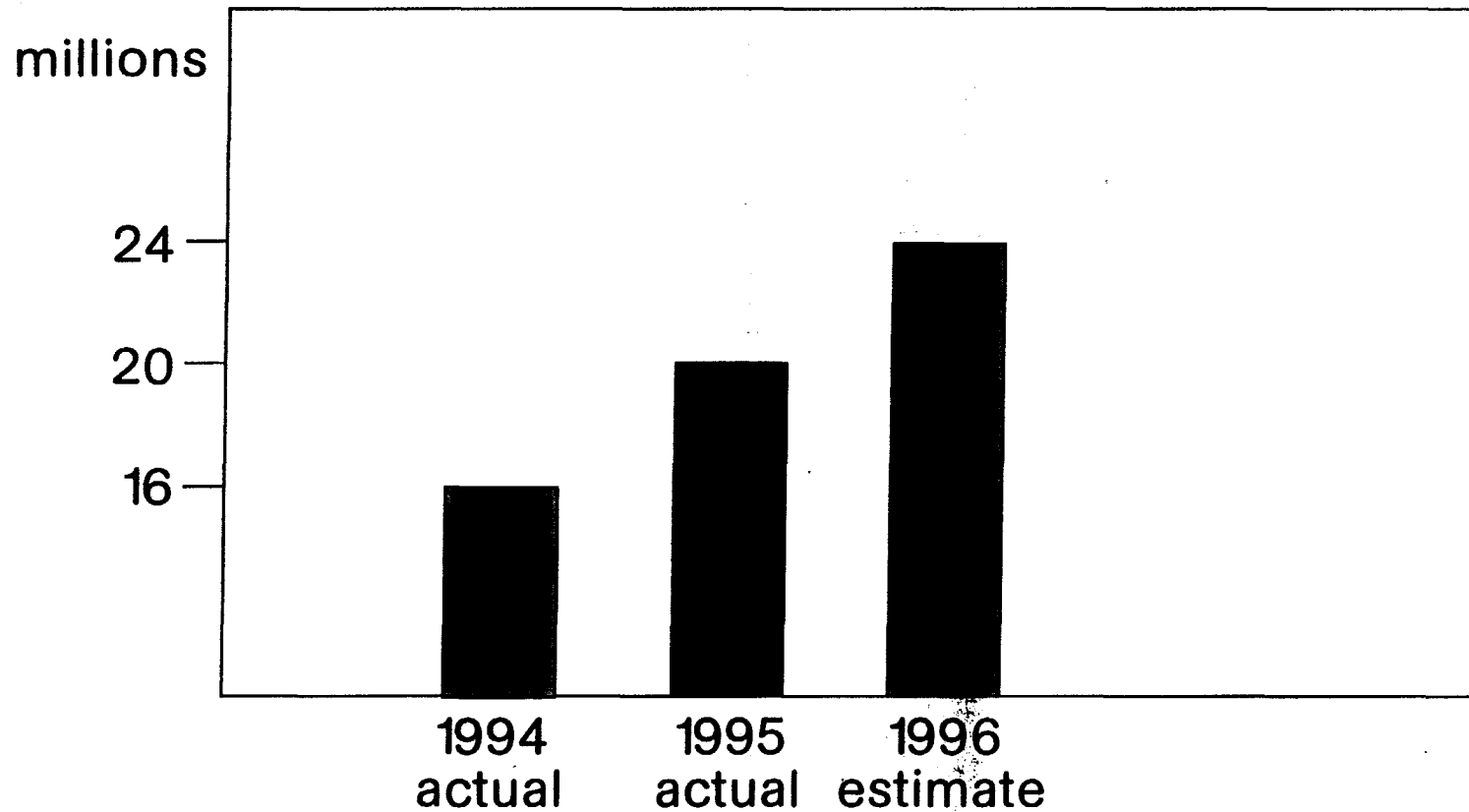
National Communications Forum
October 16, 1996
Chicago, Illinois

The Problem

FCC Report and Order on June 12, 1996:

"Not later than five years after the effective date of the rules... carriers are required to... identify the latitude and longitude of a mobile unit making a 911 call within a radius of no more than 125 meters in 67% of all cases"

911 Cellular Telephone Calls



In Massachusetts 40,000 calls per month to PSAPs

Solutions

- LORAN

- Triangulation

 - Transponder

 - Direction Finding

 - TDOA

- GPS

 - Raw GPS Data to Dispatch Office

 - Modem Location to Dispatch Office

 - FoneFinder Verbal LAT. / LON.

Location Technologies

System

Cost

- | System | Cost |
|----------------------|---|
| • Code Alarm | • \$ 35 / month Phone
\$ 40 / month monitoring |
| • MAYDAY MIKE | • \$ 149 / Radio, no infrastructure |
| • TELETRAK | • \$ 500k / cell site |
| • NAVSYS | • \$ 2.5 million / state |
| • Sanders Associates | • \$ 90k cell site |
| • Motorola RESCU | • \$ 1500 / install
\$ 100 / year monitoring |
| • KSI | • \$ 50k cell site |
| • Associated Group | • \$ 50k cell site |
| • FoneFinder | • \$ 4 / month, 36 months
No Infrastructure |

Triangulation Cost

(TDOA System for the State of New Jersey)

Calculation

Cellular	A, B
PCS	5 for every market
	2 for major market
Nextel	1
Geotek	1
No. of Carriers	<u>10</u>

200 sites per carrier x 10 carriers

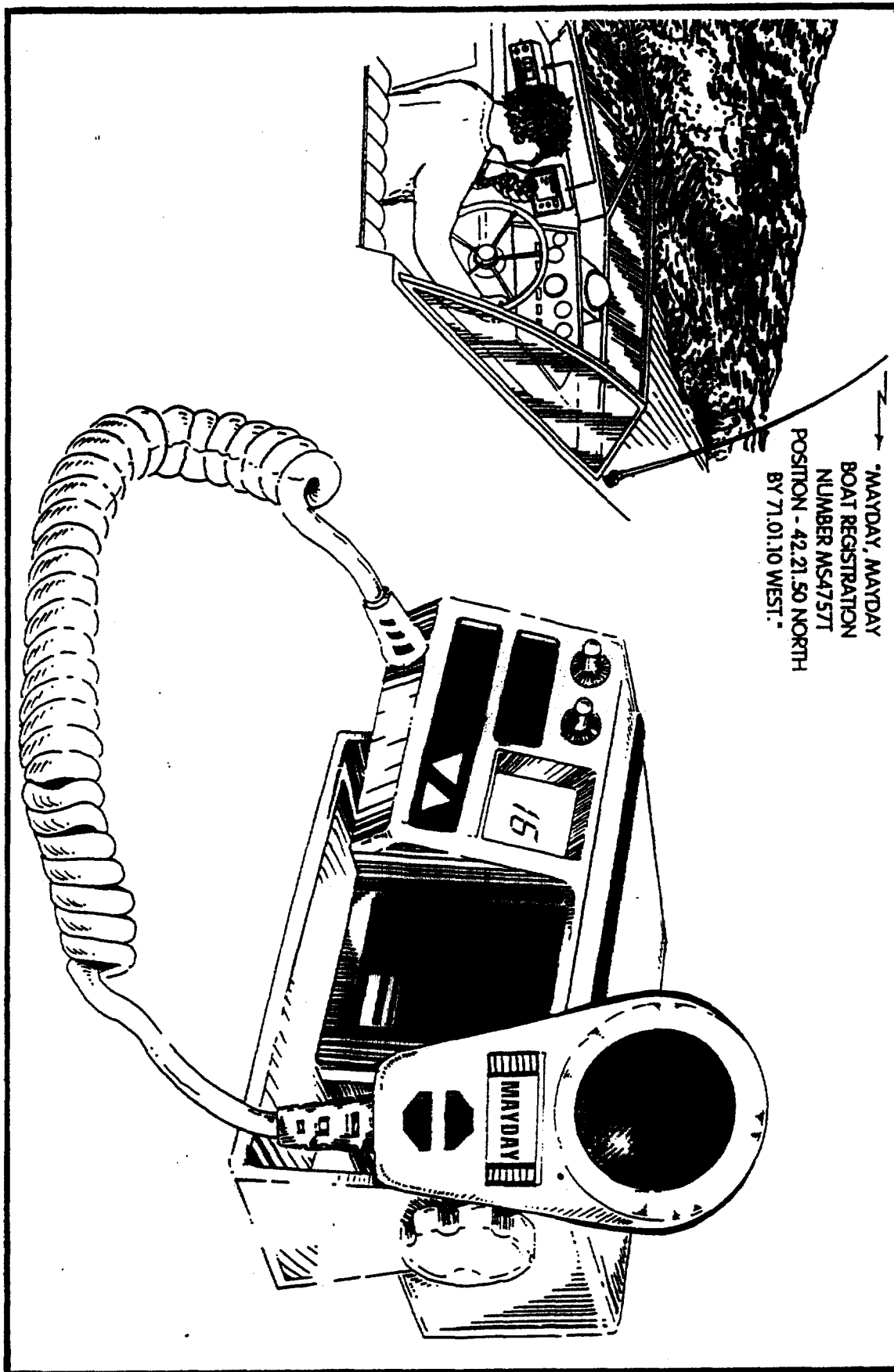
= 2000 sites x \$50k / site

= \$ 100 million

x 50 states = **\$5 billion**

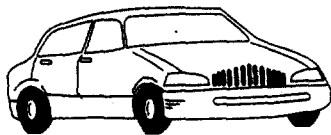
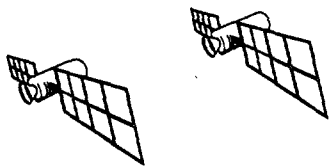
FoneFinder Cost

\$ 4 / month / 36 months



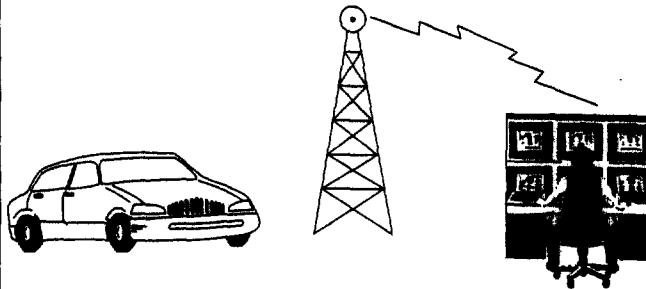
↑
"MAYDAY, MAYDAY
BOAT REGISTRATION
NUMBER MS4757T
POSITION - 42.21.50 NORTH
BY 71.01.10 WEST."

1



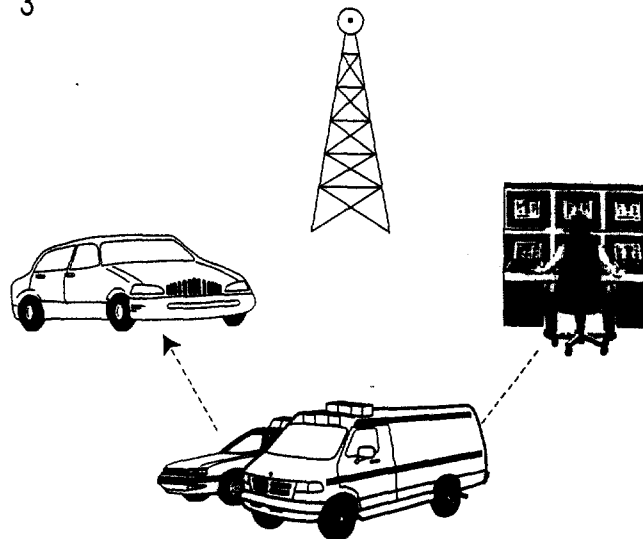
The Global Positioning Satellite System continuously updates the vehicle's location. This information is retained by Lincoln RESCU system in the 1996 Continental.

2

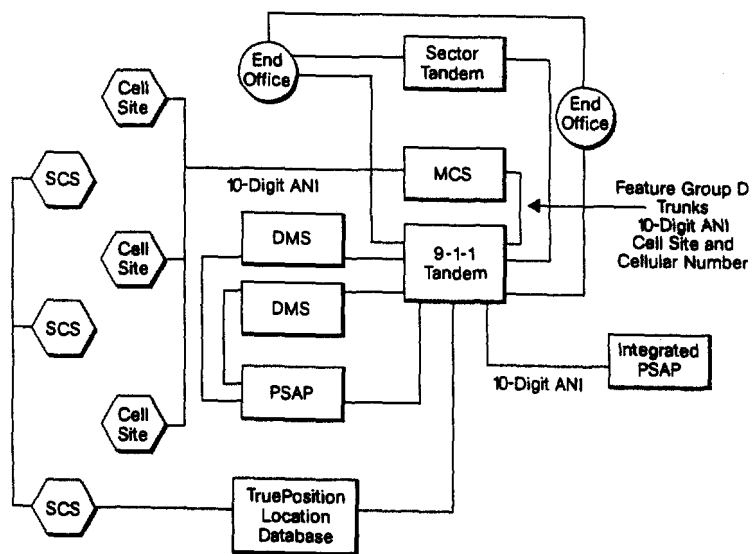
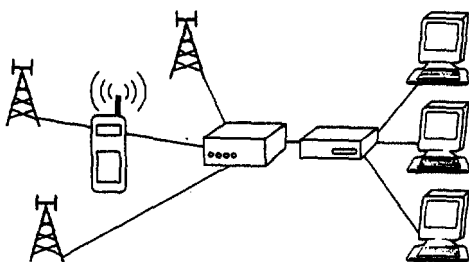
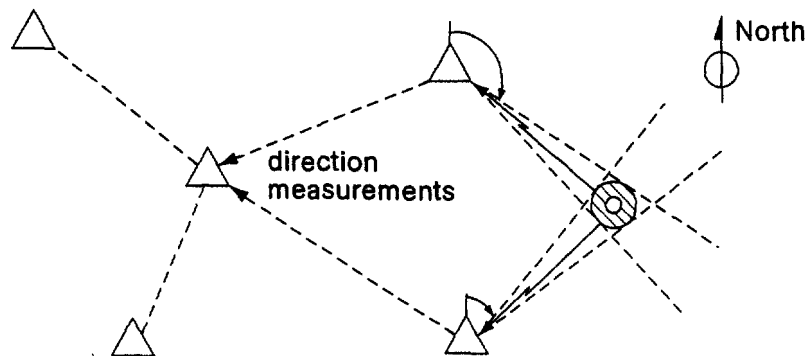


The motorist pushes the Lincoln RESCU button inside the car to initiate a cellular call. Vehicle location and owner data are relayed to the Lincoln Security Center as part of the call.

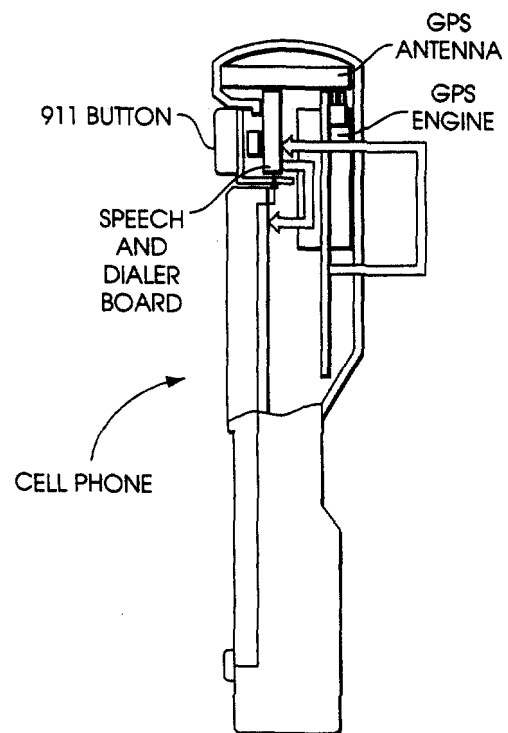
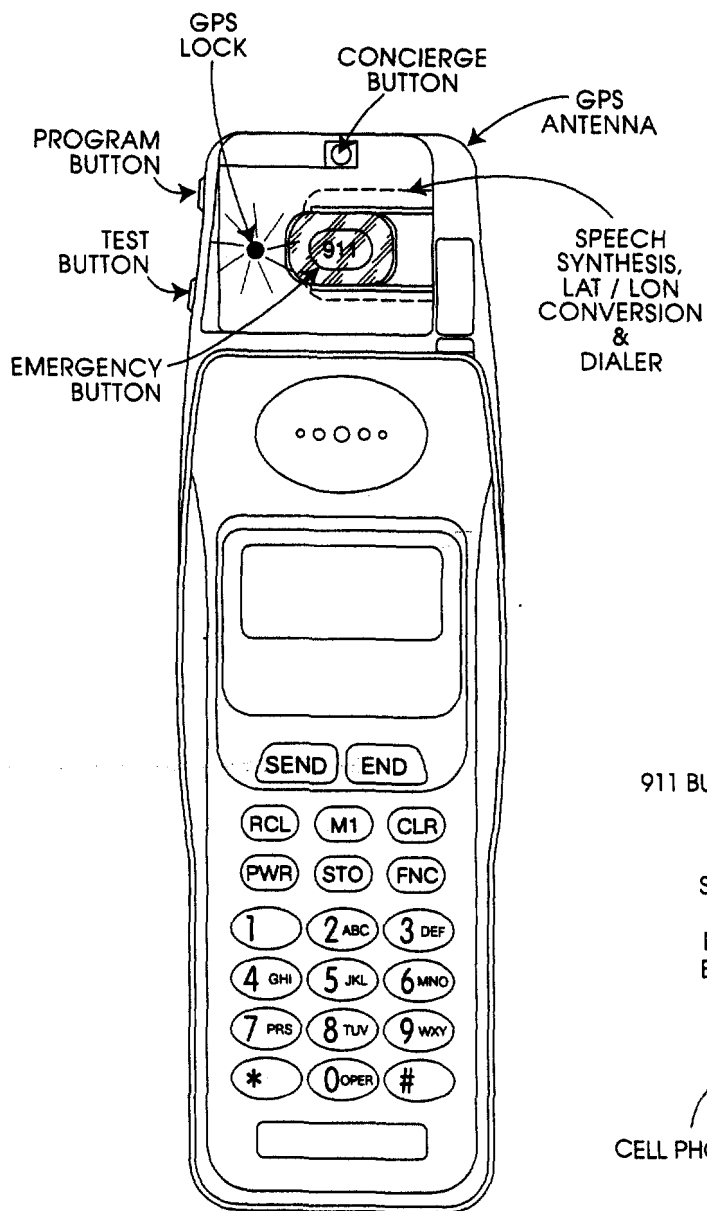
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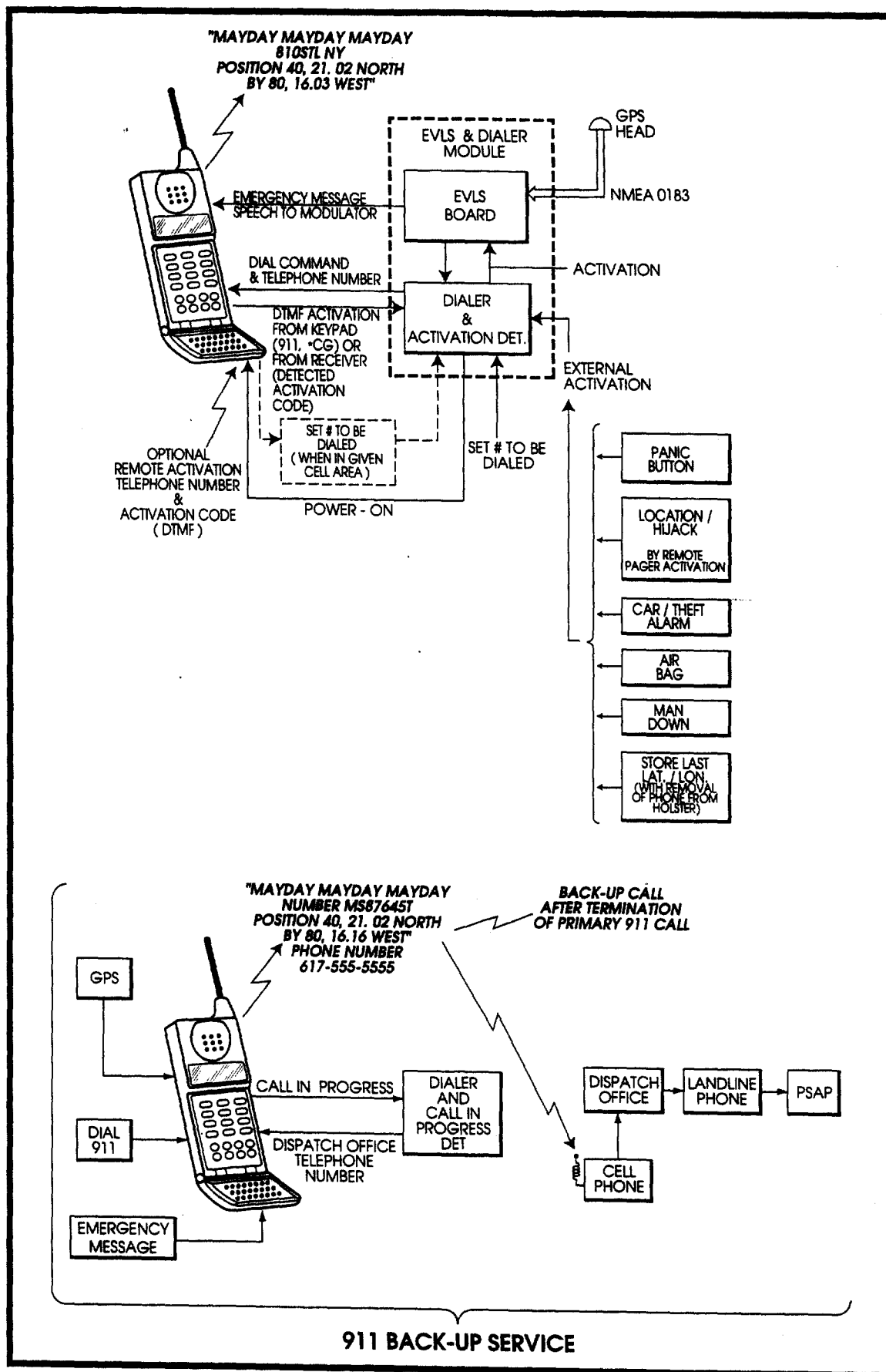


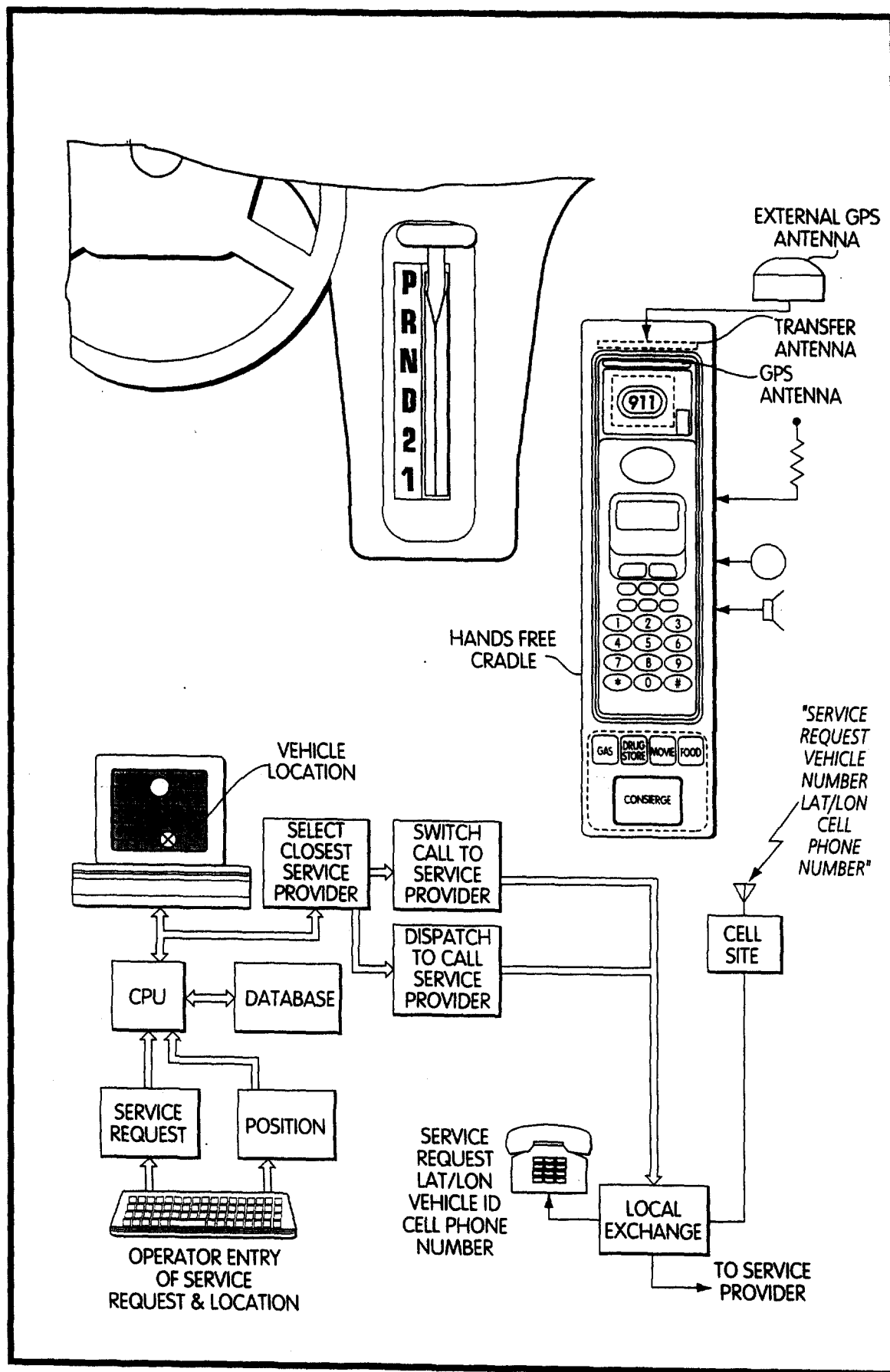
Via cellular phone system, Lincoln Security talks to the motorist, confirming location and determining what assistance is needed. The security agent then brings the appropriate public emergency response agency or roadside dispatch service in on the call.



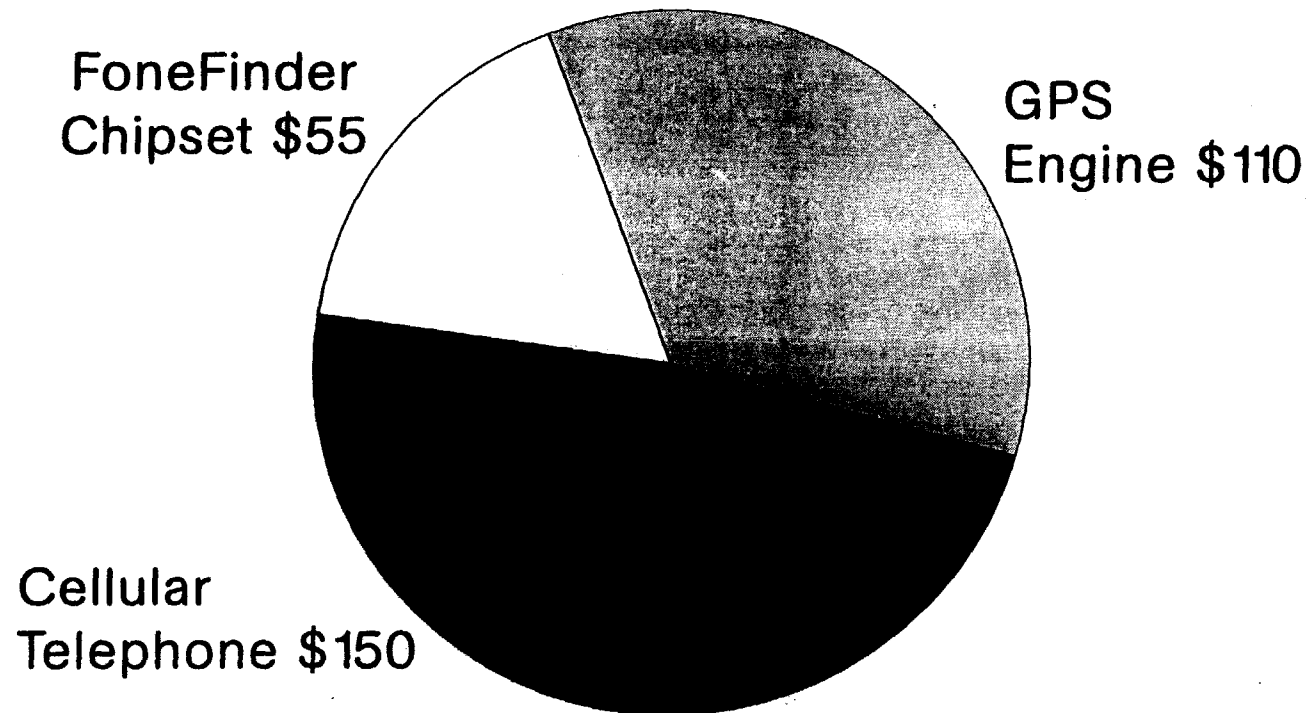
DMS = Database Management System
(Master Street Address Guide resides within)
MSC = Mobile Switching Center
PSAP = Public Safety Answering Point
SCS = TruePosition Signal Collection System
overlay (collocated) on Cell Sites







Phone Costs with FoneFinder



Total Cost \$300 - \$350

No Infrastructure

FoneFinder Economics

\$ 4 per month for 36 months

no cut contract

eliminates churn

funds equipment

911 back-up Service

Revenue stream to carrier, back-up dispatcher and PSAPs

Revenue from National Concierge Service

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C E L L U L A R

ABSTRACT

In view of the over 20 million cellular E-911 calls placed annually in the United States, the Federal Communications Commission has issued a Report and Order requiring that either the carriers or the manufacturers provide systems which will identify the location of the E-911 caller to within 125 meters, while at the same time providing the PSAPS with the telephone number of the E-911 caller. The Automatic Location Identification (ALI) and the Automatic Number Identification (ANI) are required respectively in five years and eighteen months from the date of the Report and Order. This paper outlines the history of the attempt to solve the Automatic Location Identification problem in terms of triangulation and GPS approaches and indicates the problems and successes of these approaches.

INTRODUCTION

On June 12, 1996 a Report and Order (CC Docket Number 94-102: RM-8143) was adopted June 12, 1996 by the FCC stating:

"Not later than five years after the effective date of the rules adopted in this proceeding, covered carriers are required to achieve the capability to identify the latitude and longitude of a mobile unit making a 911 call within a radius of no more than 125 meters in 67% of all cases."

The reason behind the promulgation of the Report and Order is that the number of emergency calls from cellular phones has increased dramatically over the years, such that in Massachusetts alone there are 40,000 cellular 911 calls per month placed to the PSAP (Public Safety Access Point) in Framingham which is the point from which all cellular 911 calls are routed. According to the CTIA (Cellular Telecommunications Institute of America), last year there were in excess of 18 million cellular 911 calls nationwide.

The problem is so severe that (according to Don Nagle, Chief of Telecommunications of the Commonwealth of Massachusetts) it takes an average of approximately 10 minutes to locate a cellular 911 caller, with an injured person expiring from a cut artery in as little as 8 minutes. The problem of identifying the location of E-911 callers is exacerbated by the fact that the individual may not be conscious, may not speak the English language, may be too hysterical to give adequate information to the dispatchers, or

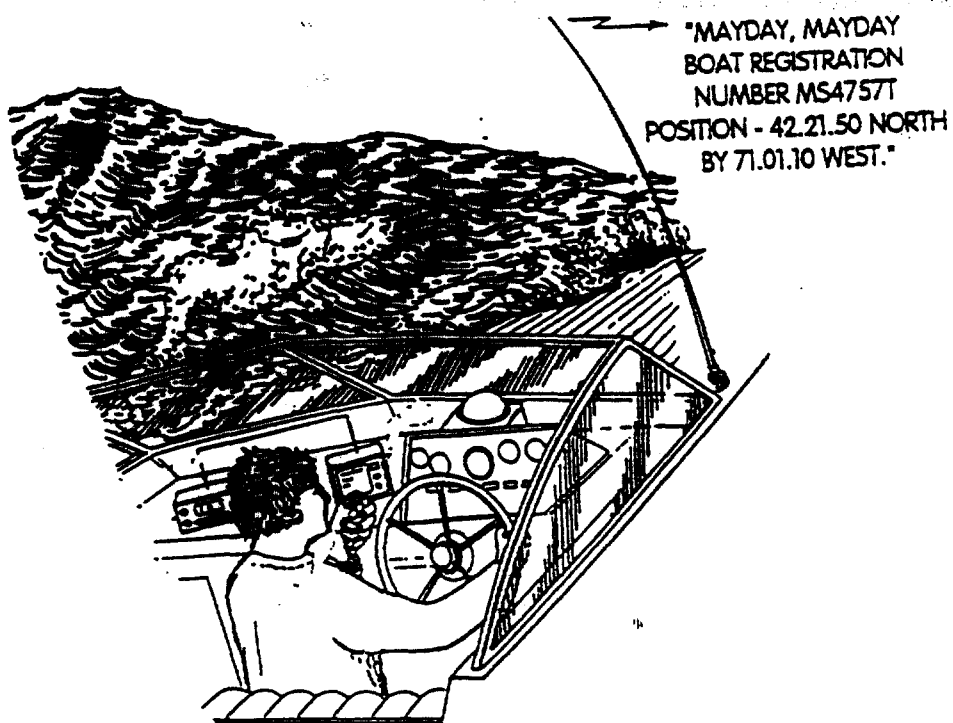
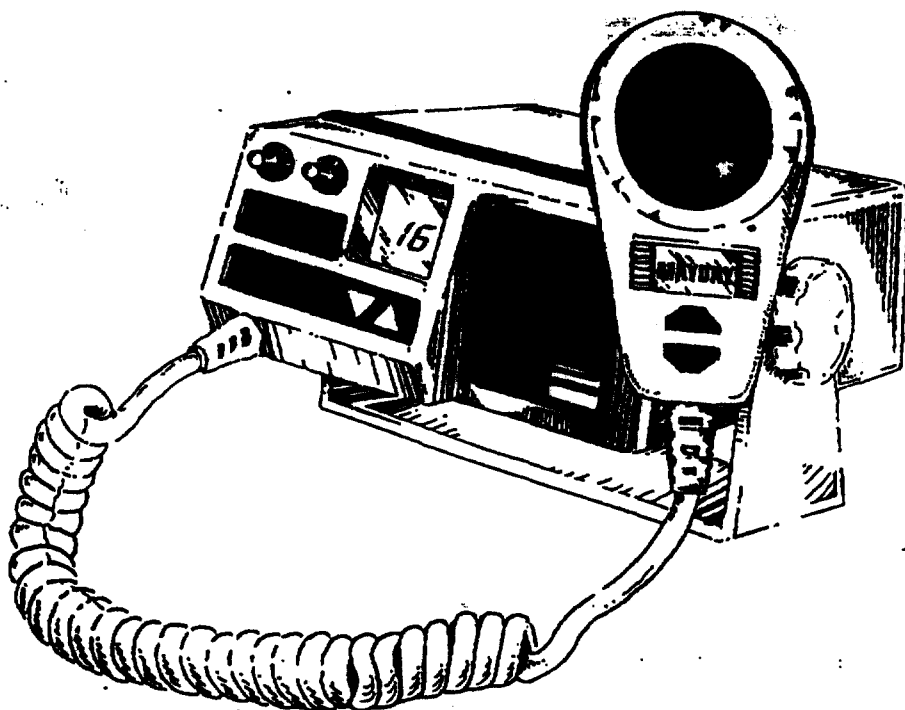
more likely, does not know where he/she is. In a panic situation, most E-911 callers have not a clue as to where they are within a town, much less the town that they are in.

U.S. COAST GUARD

The identification of the location of wireless transmissions in the past has most noticeably been carried out by the United States Coast Guard utilizing radio direction finding equipment for VHF radio transmissions. VHF RDF (Radio Direction Finding) techniques have been successful in the Coast Guard's carrying out of its responsibilities only if the transmission can be maintained long enough to get a fix, and then only if the VHF transmitter is within range of three "high-site" antennas.

With the advent of LORAN and GPS systems, boaters are increasingly able to report their location in terms of latitude and longitude through the readout of these devices to the Coast Guard stations receiving the calls. In addition, in 1985, Shakespeare produced a MayDay Mike radio, with automatic synthetic voice annunciation of the latitude and longitude (see Figure 1). Simultaneously, a system called Digital Selective Calling or DSC was developed by Ross Engineering of Largo, Florida which digitally transmitted the latitude and longitude to Coast Guard stations.

From the marine point of view, the MayDay Mike system and the DSC systems provide the location of a stricken vessel through the transmission of latitude and longitude garnered



- FIGURE 1 -

locally from either LORAN or GPS receivers. The problem with Digital Selective Calling was the failure to deploy equipment making its utility questionable. The receivers cost initially in excess of \$1500 and were not widely accepted by the boating public. As a result, according to Joe Hersey, Head of Telecommunications, USCG, a test program with the United States Coast Guard in Chicago resulted in fewer than three calls in the first month of operation.

With respect to the MayDay Mike System, VHF radio sales plummeted from 1.2 million in 1992 to less than 100,000 in 1995 due to saturation and the use of cellular phones by mariners.

LAND MOBILE

From the land lubber's point of view, the first attempt of radioing the latitude and longitude of a stricken vehicle, was developed by The Code Alarm Company of Madison Heights, Michigan in which a dedicated cellular phone was provided with a LORAN receiver and a separate LORAN antenna, with the result being modemed to a central dispatch office in Wisconsin. This system was not well received because of costs that involved the payment for a dedicated cellular phone, the provision of a separate long whip LORAN antenna, and the fact that the calls were modemed to a central processing point from which services were to be dispatched. Note, Code Alarm has not offered this product for a year.